

Translation

PATENT COOPERATION TREATY

PCT/EP2003/014188



PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 0000054178	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP2003/014188	International filing date (day/month/year) 13 December 2003 (13.12.2003)	Priority date (day/month/year) 19 December 2002 (19.12.2002)
International Patent Classification (IPC) or national classification and IPC C07C 263/10, B01D 53/70, C01B 7/07		
Applicant BASF AKTIENGESELLSCHAFT		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 17 June 2004 (17.06.2004)	Date of completion of this report 04 February 2005 (04.02.2005)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

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I. Basis of the report

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☒ the description:
 pages _____ 1-15 _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☒ the claims:
 pages _____ 1-16 _____, as originally filed
 pages _____, as amended (together with any statement under Article 19
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the drawings:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

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V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-16	YES
	Claims		NO
Inventive step (IS)	Claims	1-16	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-16	YES
	Claims		NO

2. Citations and explanations

Reference is made to the following documents:

D1: US-A-3 544 611

D2: US-A-3 574 695

D3: US-A-2 764 607

D4: US-A-3 142 535

The present claim 1 relates to a method for separating a substance mixture comprising hydrochloride and phosgene, optionally solvents and optionally low-boiling fractions and inert substances such those which normally arise during the production of isocyanates by reacting amines with phosgene, characterised in that the following steps are carried out:

(A) firstly, partial or complete condensation of phosgene

(B) secondly, distillation or stripping in a column to remove the hydrogen chloride from the sump product phosgene, and

(C) finally, washing the hydrogen chloride head product with the process solvent to absorb the phosgene in the process solvent.

1.) None of the available prior art documents discloses a method for separating a substance mixture consisting of hydrogen chloride and phosgene, optionally solvents and optionally low-boiling fractions and inert substances such as those which normally arise during the production of isocyanates by reacting amines with phosgene, by a combination of the steps (A), (B) and (C). The subject matter of claim 1 (and dependent claims 2 to 16) is therefore novel (PCT Article 33(2)).

2.) D1 is considered the prior art closest to the subject matter of claim 1.

In the light of the teaching of D1, the present application addresses the problem of providing a further method for separating hydrogen chloride and phosgene in which both hydrogen chloride and phosgene are obtained with a high degree of purity.

Proceeding from the method known from D1, the problem is solved in that the final method step of D1, namely the condensation of the remaining phosgene from the hydrogen chloride stream, is replaced by absorption (step (C)). Neither D1 on its own, nor in combination with any other prior art document, suggests to a person skilled in the art that, in the method of D1, the remaining phosgene can be removed by absorption in such a way that highly pure hydrogen chloride is obtained.

In this respect, D4 reports that, whereas large amounts of phosgene can be easily removed from the hydrogen chloride by stripping with a solvent (as is described in D2 and D3), it is difficult to remove the last traces of a phosgene contaminant from hydrogen chloride. The teaching of D4 therefore moves away from the method of the present claim 1.

Furthermore, the method of the present claim 1 has energy advantages, because lower temperatures are required for

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the condensation known from D1.

In conclusion, the subject matter of claim 1 (and dependent claims 2 to 16) involves an inventive step (PCT Article 33(3)).

3.) Pure hydrogen chloride and pure phosgene are industrially useful starting materials. The subject matter of claims 1 to 16 is therefore industrially applicable.